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(54) Digital hearing aid microphone

(57) The present invention is directed to an improved digital hearing aid microphone with an analog-to-digital converter placed within the integral housing of the microphone.

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Description

Technical Field

[0001] The present invention relates to a digital hearing aid microphone having an analog-to-digital converter within the integral housing of the microphone.

Background of the Invention

[0002] In a conventional digital hearing aid microphone, an analog signal from the microphone is converted into a digital signal prior to being amplified. Because a digital signal is less susceptible to noise than an analog signal, the digital signal is less likely to pick up noise through the hearing aid. The analog signal from the microphone, however, remains susceptible to noise between the microphone and the analog-to-digital converter.

[0003] U.S. Patent No. 5,796,848 discloses a hearing aid with an additional housing surrounding both an operating microphone and an analog-to-digital converter. The additional housing shields the hearing aid from high-frequency electromagnetic signals. The hearing aid disclosed in U.S. Patent No. 5,796,848 thus requires a hearing aid housing, an operating microphone with an integral housing and an additional shielding housing surrounding both the operating microphone and the analog-to-digital converter. In particular, U.S. Patent No. 5,796,848 refers to the use of the semiconductor microphone disclosed in German Utility Model 8910743.8 in its digital hearing aid. A copy of German Utility Model 8910743.8 and its translation is enclosed herewith. The microphone disclosed in German Utility Model 8910743.8 comprises a transducer motor acoustically coupled to an integral housing, as shown in Figure 2. Accordingly, U.S. Patent No. 5,796,848 discloses an additional shielding housing surrounding an operative microphone having a sigma-delta modulator monolithically integrated on the semiconductor component part of the microphone, placed within a hearing aid housing.

Summary of the Invention

[0004] The present invention relates to a microphone comprising an integral housing and an analog-to-digital converter within the integral housing. By placing the analog-to-digital converter within the integral housing, an additional shielding housing, as required by U.S. Patent No. 5,796,848, is not necessary to shield the output of the microphone from unwanted interference or noise.

Brief Description of the Drawings

[0005] Figure 1 is a cross-sectional view of the microphone assembly of the present invention.

Detailed Description

[0006] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiment illustrated.

[0007] A hearing aid used to correct a hearing impairment typically comprises a microphone, an amplifier and a receiver. The microphone receives sound and converts the sound to an electrical signal, which is amplified by the amplifier and converted back to sound by the receiver. A hearing aid microphone, generally designated 10, is illustrated in Figure 1. The microphone 10 comprises a housing 12 having an inlet tube 14 extending outwardly from a wall 16 of the housing 12. The inlet tube 14 receives sound and communicates the received sound into the microphone 10. A diaphragm 18 in the microphone 10 defines a front volume 10a and a back volume lOb. The diaphragm 10 vibrates in response to the sound, resulting in an electrical signal. The electrical signal is converted to a digital signal by an analog-to-digital (A/D) converter 20 within the housing 12 of the microphone 10. The digital signal is transmitted out of the microphone.

[0008] While the specific embodiment has been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention and the scope of protection is only limited by the scope of the accompanying Claims.

Claims

1. A hearing aid microphone comprising:

an integral housing; and
an analog-to-digital converter within said integral housing.

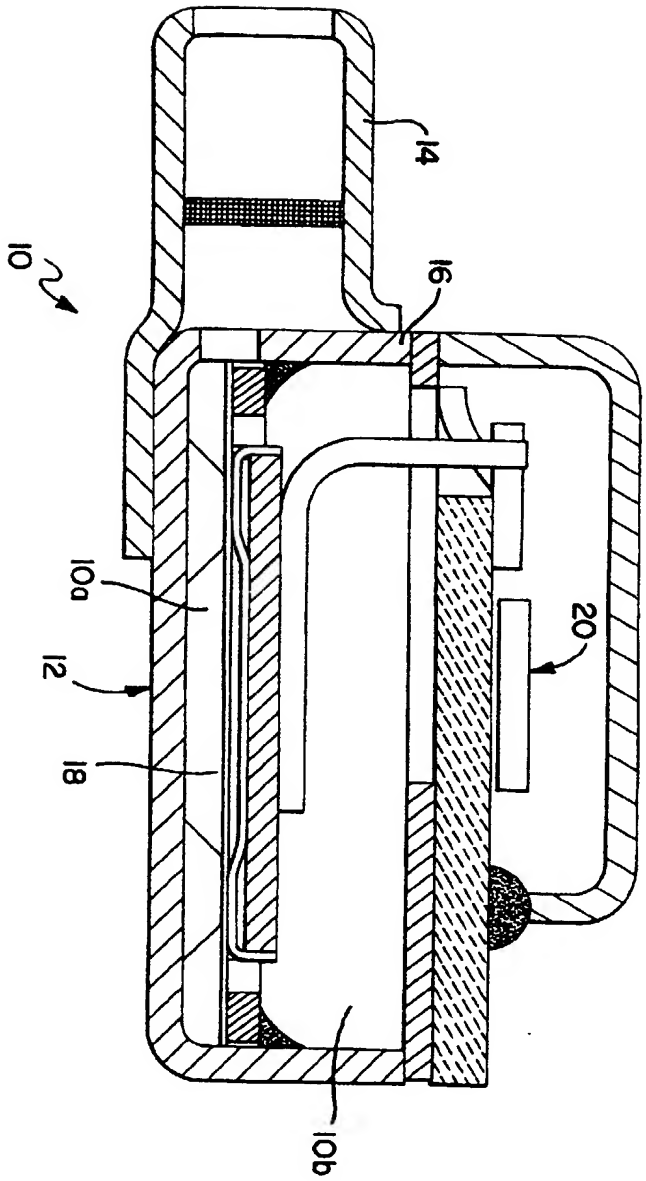

FIG. 1